REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections contained in the Office Action of March 2, 2006 is respectfully requested.

Claims 5-10, including independent claim 5, were pending and treated in the outstanding Office Action. In particular, the Examiner rejected independent claim 5 and dependent claims 6, 7, 9, and 10 as being unpatentable over the Uzoh reference (US 6,113,769) in view of the Andricacos reference (US 5,352,350); and rejected claim 8 as being unpatentable over the Uzoh reference in view of the Andricacos reference, and further in view of the Smith reference (H36). However, independent claim 5 has now been amended as shown above so as to incorporate the subject matter of dependent claims 6 and 10. For the reasons discussed below, it is respectfully submitted that amended independent claim 5 and the claims that depend therefrom are clearly patentable over the prior art of record.

As generally explained in paragraph [0011] of the specification, it is difficult to maintain the correct concentration of components within a plating liquid during a plating operation. In particular, the rate of consumption of the components within the plating liquid will often vary due to changes in the plating conditions. For example, the amount of plating liquid will be reduced during the plating operation due to consumption of the components of the plating liquid, and different components of the plating liquid may be consumed at different rates depending on variable plating parameters. As a result, it is often difficult to produce uniform and homogeneous films during the plating process.

As explained in paragraph [0014], one object of the present invention is to provide a method of managing a plating liquid to address the above problems. In particular, as recited in amended independent claim 5, the method comprises analyzing the components of the sample plating liquid. Based on the results of the analyzing, the plating liquid is replenished with component replenishing liquids containing the components of the plating liquid, and a total amount of the component replenishing liquids to be supplied to the plating liquid is substantially equal to a reduction of an amount of the plating liquid *caused by plating substrates in the plating apparatus*. Furthermore, each of the component replenishing liquids includes a standard liquid

and a plurality of solutions, and each of the solutions includes a basic liquid including copper sulfate and sulfuric acid, and includes one of a plurality of different types of additives. The *standard liquid includes the basic liquid, the plurality of different types of additives, and hydrochloric acid.* Furthermore, the replenishing is performed in a manner so as to maintain concentrations of the components of the plating liquid within a certain management range. Consequently, the concentrations of the components can be managed more carefully, and it is possible to produce uniform and homogeneous films using the plating liquid (see paragraph [0070] of the specification).

The Uzoh reference relates to a method of plating metal onto substrates, including sampling a plating liquid using a sensor or monitor 31 and analyzing the condition of a plating bath using a controller 33. With respect to original dependent claim 6, the Examiner asserted that the Uzoh reference also teaches *draining* liquid from a tank. Therefore, the Examiner asserted that it would have been obvious to one of ordinary skill in the art to have made the rate of draining equal to the rate of supplying the replenishing liquids in order to maintain the total volume of liquid at the same level throughout the process. In this regard, it is noted that column 5, lines 3-16 of the Uzon reference teaches that a drain valve 35 is provided for *draining* plating liquid from the plating bath reservoir 1. However, the Examiner is requested to note that the subject matter of original dependent claim 6, which is now incorporated into independent claim 5, does not concern *draining* plating liquid. Instead, the subject matter of dependent claim 6 which is now incorporated into independent claim 5 recites that the total amount of the component replenishing liquids to be supplied to the plating liquid is substantially equal to a reduction in an amount of the plating liquid *caused by plating substrates in the plating apparatus*. In other words, the plating liquid is supplied in an amount substantially equal to the amount of the plating liquid consumed during the plating operation; not substantially equal to an amount of plating liquid *drained* from the plating bath reservoir.

As the Examiner noted in the Office Action, the Uzoh reference also does not teach or suggest replenishing liquids including "a standard liquid, a plurality of solutions of a basic liquid

with additives, sulfuric acid, and hydrochloric acid." Thus, it is submitted that the Uzoh reference does not teach the step of replenishing the plating liquid, including the *combination* of:

(1) replenishing so that the total amount of the component replenishing liquids is substantially equal to a reduction of an amount of the plating liquid *caused by plating substrate in the plating apparatus*, ***and***

(2) replenishing with component replenishing liquids each including a standard liquid and a plurality of solutions as recited in amended independent claim 5, in which the *standard liquid includes the basic liquid, the plurality of different types of additives, and hydrochloric acid.*

Nonetheless, the Examiner asserted that the Andricacos reference teaches that various solutions are added to plating solutions to maintain the proper electrolyte chemistry. However, the Andricacos reference also does not disclose or suggest replenishing the plating liquid as recited in amended independent claim 5, including replenishing so that the total amount of the component replenishing liquids is substantially equal to a reduction of an amount of the plating liquid *caused by plating substrates in the plating apparatus*. Furthermore, the Examiner asserted that the Andricacos reference teaches that solutions such as a standard liquid (water) are added to the plating solution. However, the "standard liquid" of water does not correspond to the standard liquid defined in claim 5. In particular, the Andricacos reference does not teach replenishing with component replenishing liquids including a *standard liquid* ***including the basic liquid, the plurality of different types of additives, and hydrochloric acid***. Thus, one of ordinary skill in the art would not be motivated by the Andricacos reference to modify the Uzoh reference so as to obtain the invention recited in amended claim 5.

The Smith reference, cited by the Examiner as teaching that the amount of copper can be inferred from a total charge transferred in the electrode plating cell, also does not disclose or suggest replenishing the plating liquid so that the total amount of the component replenishing liquids is substantially equal to a reduction of the amount of the plating liquid *caused by plating substrates in the plating apparatus*, and replenishing the plating liquid with component replenishing liquids each including a *standard liquid including the basic liquid, the plurality of*

different types of additives, and hydrochloric acid as recited in amended independent claim 5. Therefore, one of ordinary skill in the art would also not be motivated by the Smith reference so as to modify the Uzoh reference to obtain the invention as recited in amended independent claim 5. Accordingly, it is respectfully submitted that amended independent claim 5 and the claims that depend therefrom are clearly patentable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. However, if the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact the Applicant's undersigned representative.

Respectfully submitted,

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